

New species of *Macrogynoplax* (Insecta: Plecoptera: Perlidae) from Peru and Guyana

Bill P. Stark

Department of Biology, Mississippi College,
Clinton, Mississippi 39058, U.S.A.

Abstract.—*Macrogynoplax truncata*, new species, and *M. yupanqui*, new species, are described from specimens collected in Peru, and *M. flinti*, new species, and *M. kanuku*, new species, are described from specimens collected in Guyana. Holotype males are designated for each species and a revised key is provided for adults of the nine species known for the genus.

Macrogynoplax currently includes five uncommon species, each apparently endemic to remote regions of eastern South America (Zwick 1973, Froehlich 1984, Stark & Zwick 1989). Two species (*M. neblina* Stark, in Stark & Zwick 1989:248 and *M. spangleri* Stark, in Stark & Zwick 1989:251) are known from Cerro de la Neblina in southern Venezuela and the others (*M. geijskesii* Zwick, in Stark & Zwick 1989:253, *M. guayanensis* Enderlein, 1909:403, and *M. veneranda* Froehlich, 1984:39) are known from a few specimens from Suriname, Guyana, or southeastern Brazil. In this study I report the occurrence of two undescribed *Macrogynoplax* species in Peru and an additional undescribed pair in southern Guyana. Holotypes are deposited in the National Museum of Natural History (USNM).

Macrogynoplax yupanqui, new species Figs. 1–4

Adult habitus.—Biocellate. White in alcohol, possibly green in life. Unpigmented lobes along inner margins of compound eyes.

Male.—Forewing length 12 mm. Paraprocts prominently spined on anteroapical margin (Fig. 2). Sternum 9 with a pair of basolateral knobs; hammer inflated, bulb-like (Fig. 1). Aedeagal tube covered with an outer skirtlike membranous sheath

armed with fine transparent spines; tube with an inner, partially exposed sclerite; posteromedian margin of sclerite notched, and sclerotized lateral margins convergent apically. Short, membranous, apical aedeagal section bilobed on ventromedian surface; apex sparsely clothed with fine transparent setae (Figs. 3–4).

Female.—Unknown.

Nymph.—Unknown.

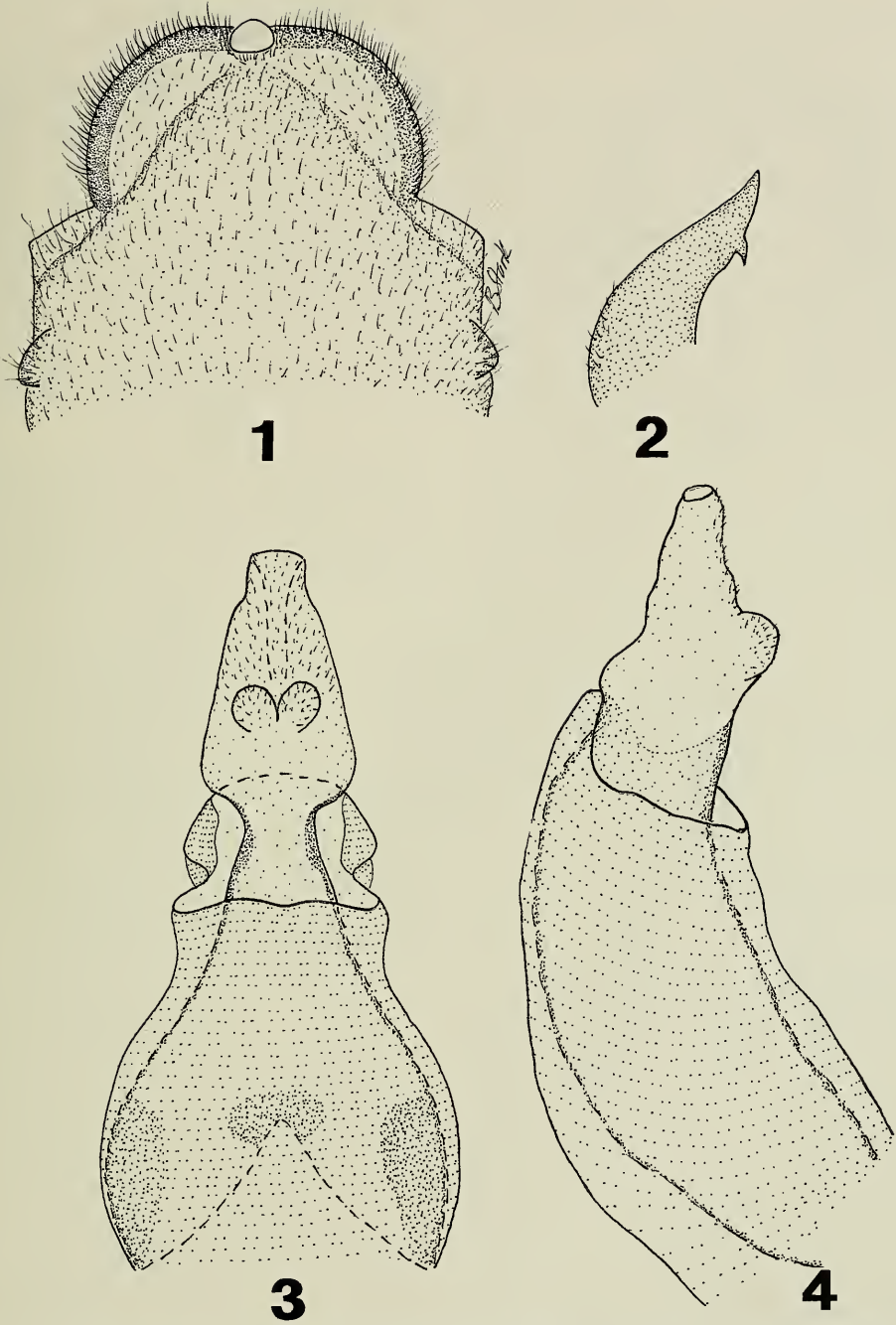
Etymology.—This species honors Tupa Inca, or Yupanqui, tenth ruler in the Inca dynasty.

Types.—Holotype ♂ from Rio Tambopata, 30 km SW Maldonado, 290 m, Madre de Dios, Peru, 21–25 Oct 1979, J. B. Heppner (USNM).

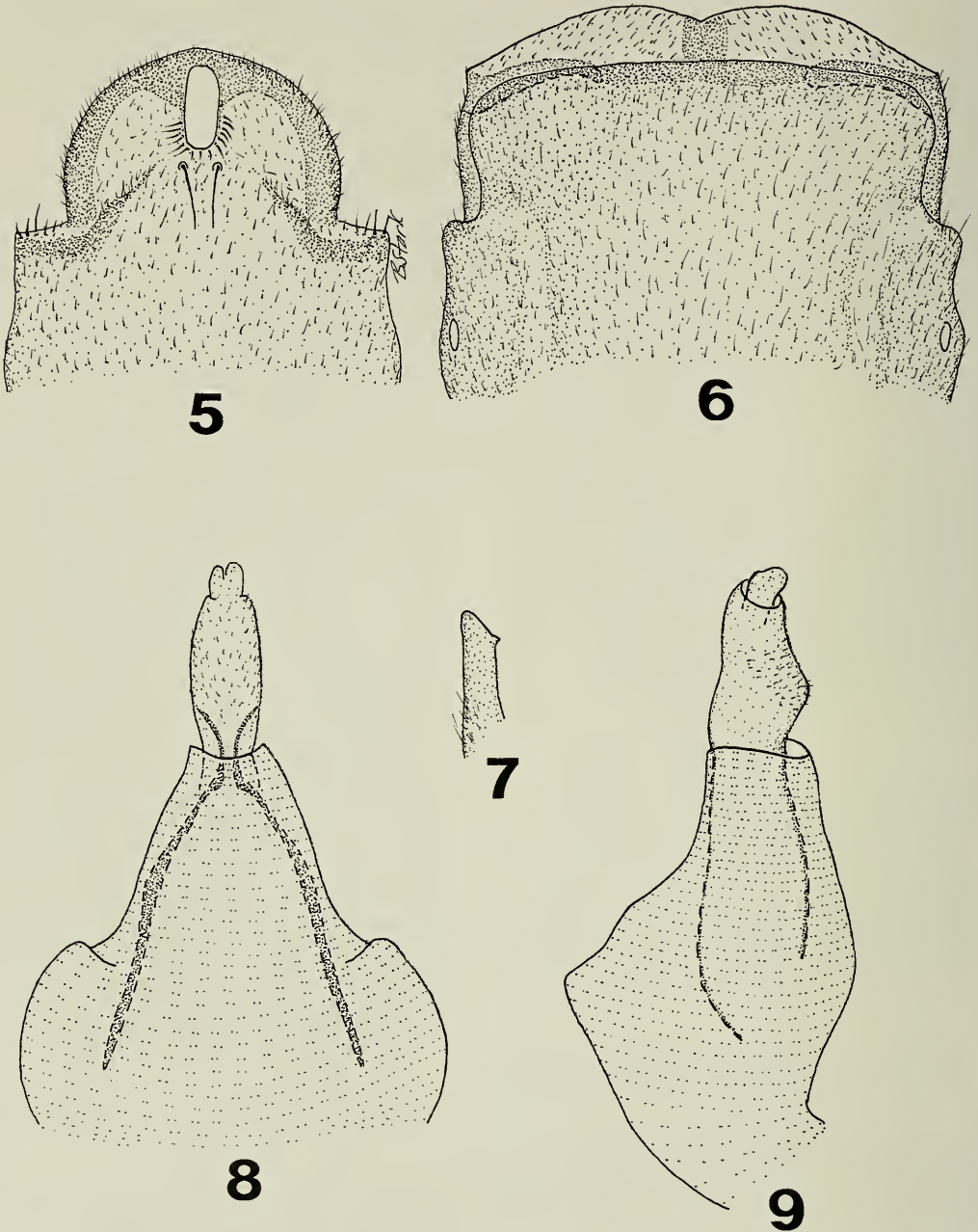
Macrogynoplax truncata, new species Figs. 5–9

Adult habitus.—Biocellate. White in alcohol, possibly green in life. Unpigmented lobes along inner margins of compound eyes.

Male.—Forewing length 10 mm. Paraprocts small, anteroapical spine minute (Fig. 7). Hammer rectangular (Fig. 5). Aedeagal tube enclosed by an outer skirtlike membranous sheath armed with fine transparent spines; inner sclerite partially exposed apically; sclerotized lateral margins of sclerite convergent apically. Short, mem-



Figs. 1-4. *Macrognoplox yupanqui* male genitalia. 1. Sternum 9; 2. Paraproct, lateral; 3. Aedeagal tube, ventral; 4. Aedeagal tube, lateral.



Figs. 5-9. *Macrogynoplax truncata* male and female genitalia. 5. Male sternum 9; 6. Female sternum 8 and 9; 7. Paraproct, lateral; 8. Aedeagal tube, ventral; 9. Aedeagal tube, lateral.

branous, apical aedeagal section sparsely clothed with fine transparent setae; apex finely divided into a pair of small membranous lobes (Figs. 8-9).

Female.—Forewing length 12 mm. Subgenital plate covers most of sternum 9; truncate posterior margin heavily sclerotized. Sternum 9 lateral bars short; median

field with a narrow longitudinal sclerite (Fig. 6).

Nymph.—Unknown.

Etymology.—The species name refers to the truncate posterior margin of the female subgenital plate.

Types.—Holotype ♂ and paratype ♀ from Rio Nanay, 25 km SW Iquitos, 120 m, Callicebus Res. Station, Loreto, Peru, 10–17 Jan 1980, J. B. Heppner (USNM).

Macrogynoplax flinti, new species

Figs. 10–13

Adult habitus.—Biocellate. Pinned specimens white with slight green tint in wing veins; possibly green in life. Unpigmented lobe along inner margins of compound eyes.

Male.—Forewing length 9 mm. Paraprocts small, anteroapical spine minute. Hammer outline triangular; sternum 9 with a pair of basolateral knobs (Fig. 10). Aedeagal tube partially enclosed by a membranous sheath armed with fine transparent spines; tube armed with a prominent ventrobasal pair of hooks and an anteapical shelf like process; tube apex with a pair of small membranous lobes, sparsely clothed with fine setae, and a long slender process (Figs. 11–13).

Female.—Unknown.

Nymph.—Unknown.

Etymology.—The patronym honors O. S. Flint, Jr., collector of the type series, for his outstanding contributions to our knowledge of Neotropical aquatic entomology.

Types.—Holotype ♂ and paratype ♂ from Aramatani Creek, Dubulay Ranch, Guyana, 5°39.4'N, 57°55.5'W, 15–18 Apr 1995, O. S. Flint (USNM).

Habitat.—Aramatani Creek is a shallow stream about two meters in width flowing through an area of wet rain forest. The substrate is mixed sand and organic debris and the normally clear water develops a tea-colored stain from runoff following periods of heavy rainfall (O. S. Flint, pers. comm.).

Macrogynoplax kanuku, new species

Figs. 14–18

Adult habitus.—Biocellate. Pinned specimens white with slight green tint in wing veins; possibly green in life. Unpigmented lobes along inner margins of compound eyes.

Male.—Forewing length 9 mm. Paraprocts small, anteroapical spine minute. Hammer outline elongate oval, orientation vertical on upturned apex of sternum 9; basolateral knobs present on sternum 9 (Fig. 14). Aedeagal tube partially enclosed by a membranous sheath armed with fine transparent spines; tube armed with a prominent ventrobasal pair of hooks; distal section a simple, partially sclerotized cylinder with a pair of small apical lobes, sparsely clothed with fine setae (Figs. 16–18).

Female.—Forewing length 12 mm. Subgenital plate covers about half of sternum 9; posterior margin rounded and notched. Sternum 9 lateral bars narrowly separated on midline; median field with a slender pale sclerite (Fig. 15).

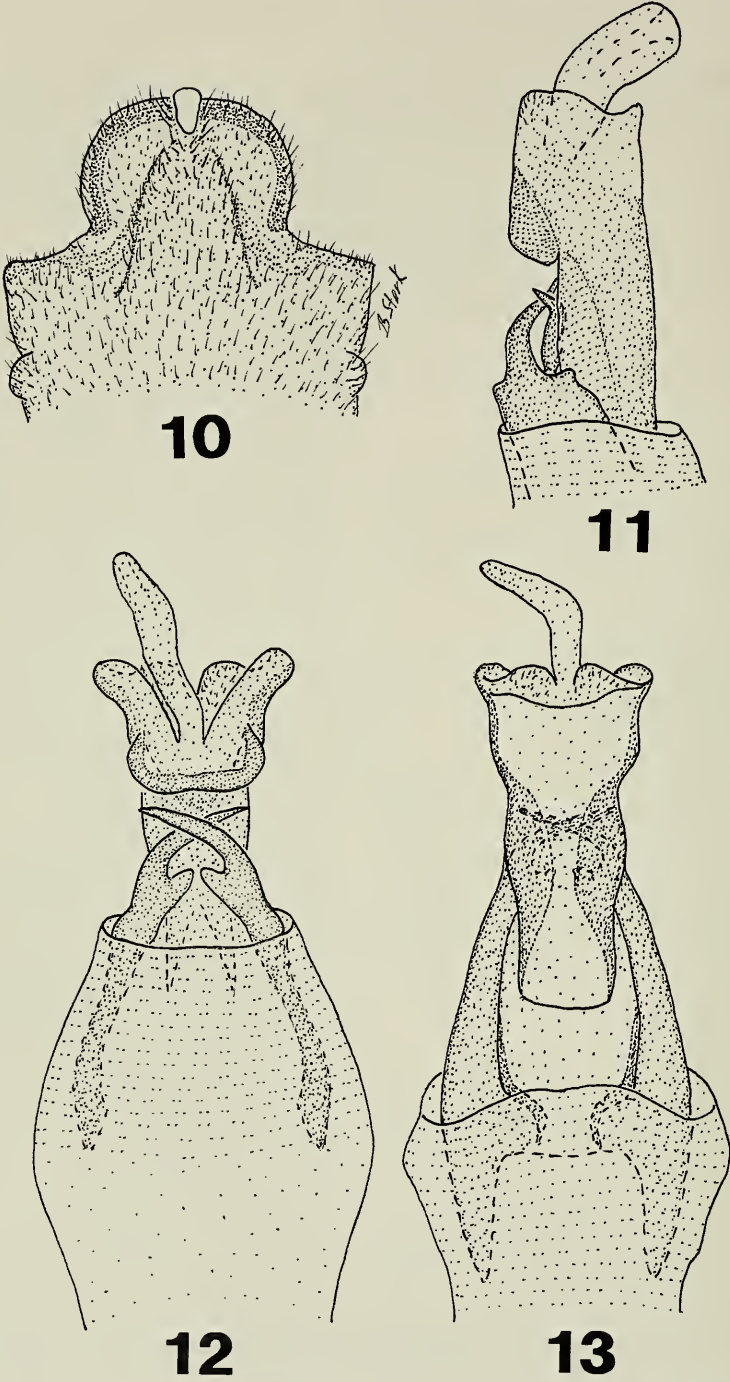
Nymph.—Unknown.

Etymology.—The species name is based on the Kanuku Mountains of southern Guyana.

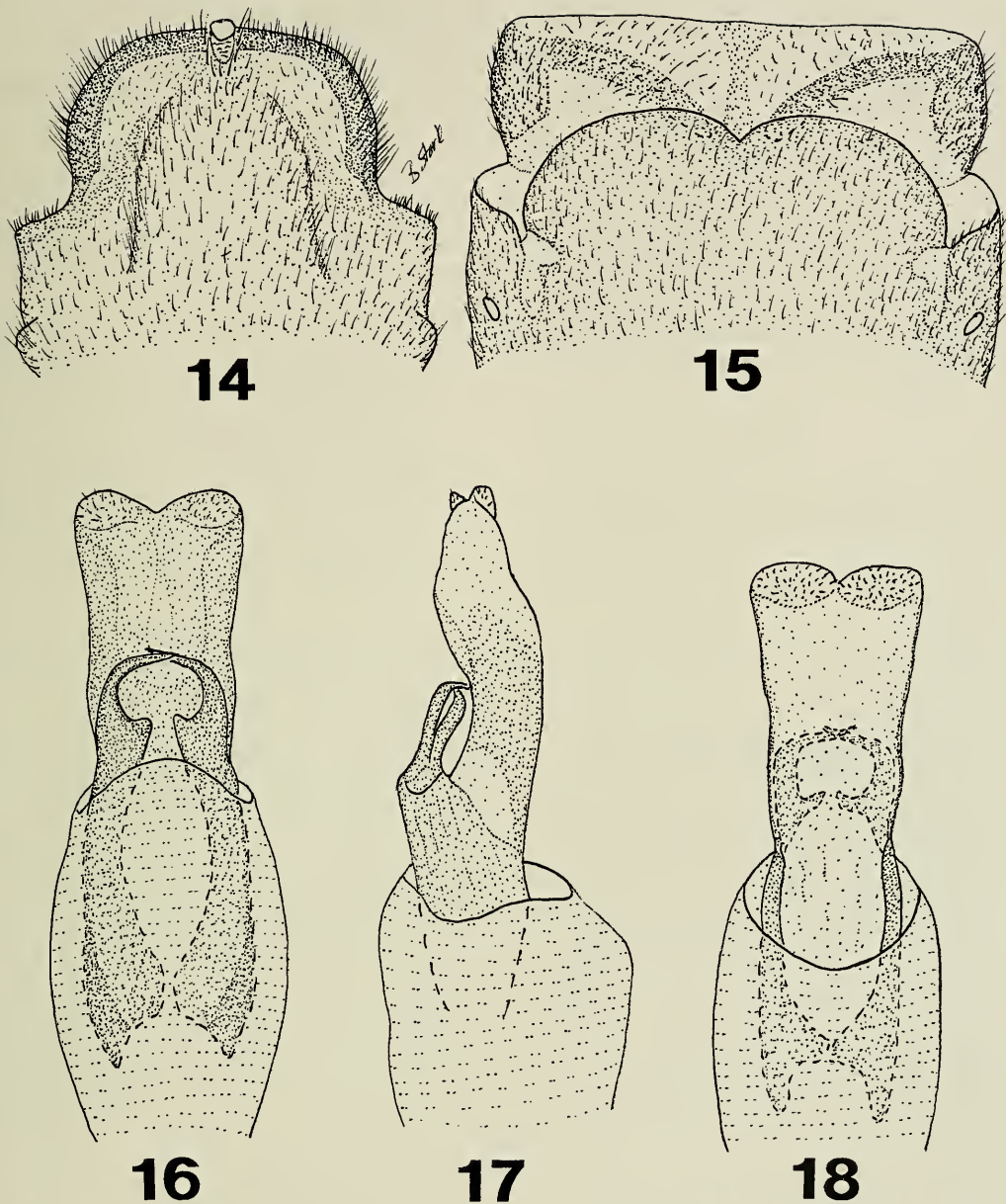
Types.—Holotype ♂ and paratype ♀ from Kumu River, Kanuku Mountains, Guyana, 3°15.9'N, 59°43.5'W, 28–30 Apr 1995, O. S. Flint (USNM).

Habitat.—Kumu River at the collecting site is 2–3 meters in width and tumbles down a heavily forested slope. Substrate varies from sand to boulders and there are numerous small springs, falls and plunge basins (O. S. Flint, pers. comm.).

Discussion.—*Macrogynoplax truncata* and *M. yupanqui* are similar to *M. spangleri* in aedeagal structure and in shape of the male 9th sternum. *M. truncata* males are easily distinguished from all known *Macrogynoplax* by hammer shape (Fig. 5) and by the apical aedeagal shape (Figs. 8–9). Females of *M. truncata* are the only known species with a truncate subgenital plate



Figs. 10-13. *Macrognoplax flinti* male genitalia. 10. Sternum 9; 11. Aedeagal tube, lateral; 12. Aedeagal tube, ventral; 13. Aedeagal tube, dorsal.



Figs. 14–18. *Macrognoplox kanuku* male and female genitalia. 14. Male sternum 9; 15. Female sterna 8 and 9; 16. Aedeagal tube, ventral; 17. Aedeagal tube, lateral; 18. Aedeagal tube, dorsal.

(Fig. 6). *Macrognoplox yupanqui* males key to *M. spangleri* in Stark & Zwick (1989) but they are distinguished on the basis of the strong paraproct spine (Fig. 2) and by the paired ventroapical aedeagal lobes (Fig. 3). *Macrognoplox flinti* and *M. ka-*

nuku share prominent sclerotized aedeagal hooks with *M. geijskesii* (Figs. 12, 16), but these two species seem more closely related to each other than either is to *M. geijskesii*. *Macrognoplox flinti* can be distinguished on the basis of the triangular hammer (Fig.

10) and the shelflike ventroapical aedeagal process (Fig. 12), but *M. kanuku* can probably be reliably separated from *M. geijskesii* only on the basis of the complexly lobed apical aedeagal section in the latter species. The subgenital plate of female *M. kanuku* is similar to that of *M. spangleri*, but perhaps is not as long, and the pale mesal sclerite of sternum 9 (Fig. 15), should distinguish females of these species. The following key to adult specimens is modified from Stark & Zwick (1989).

Males

- 1. Large subterminal sclerotized hooks on venter of aedeagal tube (Figs. 12, 16) 2
- Sclerotized aedeagal hooks absent (Fig. 3) 4
- 2. Hammer oriented vertically on upturned margin of sternum 9, outline oval (Fig. 14) 3
- Hammer oriented horizontally, apex of sternum 9 not upturned, outline triangular (Fig. 10) *flinti*
- 3. Aedeagal apex a simple cylinder with a pair of distal, sparsely hirsute lobes (Figs. 14-18) *kanuku*
- Aedeagal apex complexly lobed *geijskesii*
- 4. Hammer outline rectangular (Fig. 5) *truncata*
- Hammer outline circular (Fig. 1) .. 5
- 5. Sternum 9 apical plate strongly constricted at base, sides distinctly convex 6
- Sternum 9 apical plate slightly or not at all constricted at base, sides parallel to slightly convex (Fig. 1) 7
- 6. Aedeagal apex expanded laterally, sclerites almost joined proximal to apex *veneranda*
- Aedeagal apex gradually narrowed, sclerites separated except for apices which almost touch *neblina*
- 7. Aedeagal apex with paired dorsal lobes (Fig. 3); paraproct spine curved downward (Fig. 2) ... *yupanqui*

- Aedeagal apex without dorsal lobes; paraproct spine straight (Fig. 7) *spangleri*

Females

(*M. geijskesii*, *M. flinti* and *M. yupanqui* unknown)

- 1. Subgenital plate truncate (Fig. 6) *truncata*
- Subgenital plate notched or rounded 2
- 2. Subgenital plate extending beyond posterior margin of sternum 9 *guyanensis*
- Subgenital plate not reaching beyond posterior margin of sternum 9 3
- 3. Lateral bars of sternum 9 fused mesally under subgenital plate *neblina*
- Lateral bars of sternum 9 separated mesally 4
- 4. Subgenital plate almost reaching posterior margin of sternum 9; lateral bars narrowly separated *spangleri*
- Subgenital plate reaching slightly beyond midpoint of sternum 9; lateral bars widely or narrowly separated 5
- 5. Lateral bars of sternum 9 widely separated *veneranda*
- Lateral bars of sternum 9 narrowly separated *kanuku*

Acknowledgments

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